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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,440	12/28/2000	Suk-Won Choi	8733.373.00	6061

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LONG ALDRIDGE & NORMAN, LLP
701 PENNSYLVANIA AVENUE N.W.
SUITE 600
WASHINGTON, DC 20004

EXAMINER
DUONG, THOI V

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 05/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/749,440	CHOI ET AL.	
	Examiner	Art Unit	
	Thoi V Duong	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 28 December 2000 .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 12, lines 5 and 7, "Figure 5" should be –Figure 6--. Appropriate correction is required.

Claim Objections

2. Claims 1, 4, 5, 12, 13, 16, 17, 20, and 21 are objected to because of the following informalities: "smetic" should be –smectic--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 10-13 and 18-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10 and 18 are confusing since it is unclear what "thermally increasing the alignment of the liquid crystal molecules" means.

Claims 11 and 19, which are dependent on claims 10 and 18 respectively, recites the limitation "the temperature". There is insufficient antecedent basis for this limitation in the claims.

Claims 12 and 20, which are dependent on claims 10 and 18 respectively, are indefinite since the reduced temperature is beyond a smectic phase temperature. Beyond the smectic phase temperature, the liquid crystal layer is not ferroelectric. However, claims 10 and 18 recite a ferroelectric liquid crystal.

Claims 13 and 21, which are dependent on claims 12 and 20 respectively, are indefinite for failing to distinctly claim a ferroelectric liquid crystal since the increased temperature is beyond the smectic phase temperature. Moreover, claims 13 and 21 are confusing since the increased temperature happens at the same time as the reduced temperature cited in claims 12 and 20.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 4-6, 10-14, and 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hanyu et al. (USPN 5,200,848).

As shown in Fig. 1, Hanyu discloses a method of fabricating a liquid crystal display (LCD) device, comprising: forming a liquid crystal panel including first and second transparent substrates 11b and 11a; forming between the first and second substrates of the liquid crystal panel a ferroelectric liquid crystal layer 15 capable of forming a higher-temperature alignment state and a lower-temperature alignment state in its chiral smectic phase; and cooling the liquid crystal panel from a phase having a temperature higher than the chiral smectic phase to place the liquid crystal panel first in the higher-temperature alignment state and then further cooling the liquid crystal panel to place the liquid crystal panel in the lower temperature alignment state in the smectic phase (col. 14, lines 50-68). Hanyu discloses that the ferroelectric liquid crystal device

has an improved contrast with a high degree of alignment order of the liquid crystal modules (col. 2, lines 8-23). Hanyu further discloses that the smectic phase, which is formed in the temperature range of about 50 degrees C to –20 degrees C, includes SmC and SmC_A^* (col. 11, lines 26-38).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 7-9, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanyu in view of Applicant's Prior Art (Fig. 1).

Hanyu discloses a method of fabricating a LCD device that is basically the same as that recited in claims 3, 7-9, and 15 except that the method does not include steps of forming a pixel electrode, a thin film transistor (TFT), and a color filter, and an anti-ferroelectric liquid crystal. Applicant's Fig. 1 Prior Art shows a ferroelectric liquid crystal device which comprises a lower substrate 2 having a TFT and a pixel electrode 14, an upper substrate 4 having a common electrode and a color filter, and a ferroelectric liquid crystal layer 10 interposed between the two substrates. Due to a declination of contrast ratio, an anti-ferroelectric liquid crystal is included in the ferroelectric liquid crystal (specification page 6, lines 5-9). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Hanyu with the teaching of Applicant's Prior Art by forming a TFT and a pixel electrode

on the lower substrate and a color filter on the upper substrate, and including an anti-ferroelectric liquid crystal for further improving contrast ratio of the LCD device.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication should be directed to Thoi V. Duong at telephone number (703) 308-3171.

Thoi Duong

05/10/2002

William L. Sikes
Supervisory Patent Examiner
Technology Center 2800